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ABSTRACT

This learning module provides students with practice in applying geometric operations to vocational agriculture. The module consists of unit objectives, definitions, information, problems to solve, worksheets suitable for various levels of vocational agriculture instruction, and answer keys for the problems and worksheets. This module, which covers perimeter, area, and volume, provides practice in using basic computational skills to solve problems relating to these concepts. Practical applications include measuring cropland and calculating quantities of materials needed for a job. (KC)

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PERIMETER, AREA, AND VOLUME

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TEACHING UNIT: PERIMETER, AREA, AND VOLUME

TRAINING ACTIVITIES : Solving stated problems

UNIT OBJECTIVES : (1) To provide experiences which will enable students to develop an understanding of how to use basic computational skills to solve problems relating to perimeter, area, and volume.

(2) To present arithmetic concepts of working perimeter, area, and volume problems in a manner keeping with the interest of Vocational Agriculture students.

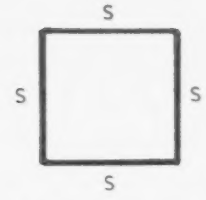
FORMULAS OF MENSURATION :

Mensuration formulas deal with the perimeters, areas, and volumes of geometric figures. In the formulas given below, the following letters are used consistently; others as indicated.

A = area	C = circumference	d = diameter	P = perimeter
r = radius	h = height	B = area of base	$\pi = 3.14$

PERIMETERS AND AREAS

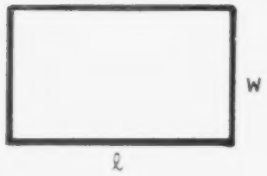
SQUARE



$P = 4s$

$A = s^2$

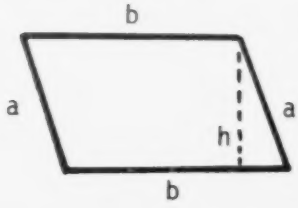
RECTANGLE



$P = 2\ell + 2w$

$A = \ell w$

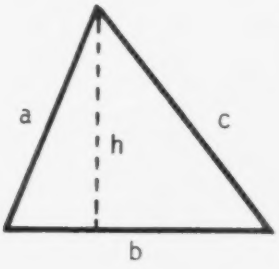
PARALLELOGRAM



$P = 2a + 2b$

$A = bh$

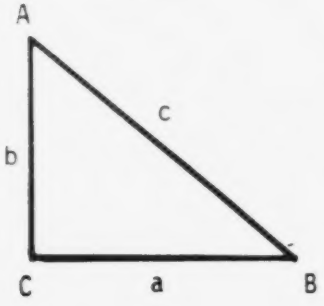
GENERAL TRIANGLE



$P = a + b + c$

$A = \frac{1}{2}bh$

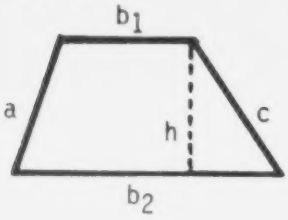
RIGHT TRIANGLE



$P = a + b + c$

$A = \frac{1}{2}ab$

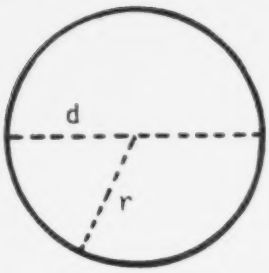
TRAPEZOID



$P = a + b_1 + b_2 + c$

$A = \frac{1}{2}(b_1 + b_2)h$

CIRCLE



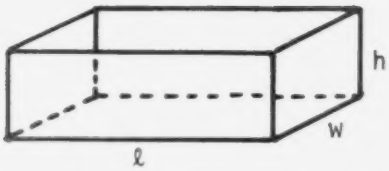
$C = 2\pi r$

$C = \pi d$

$A = \pi r^2$

VOLUMES

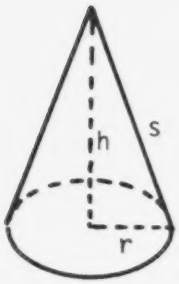
RECTANGULAR PRISM



$B = \ell w$

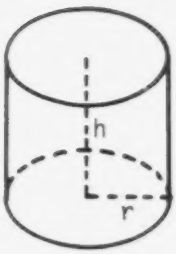
$V = Bh$ or ℓwh

CONE



$V = \frac{1}{3}\pi r^2 h$

CYLINDER



$V = \pi r^2 h$

NAME _____

INSTRUCTIONS: Solve the following problems.

1. Mrs. Smith's garden is shaped like a rectangle. It is 175 feet long and 48 feet wide. What is the perimeter of her garden?

_____ feet.

2. Susan planted a flower bed in the shape of a triangle. The sides measure 3 1/4 yards, 2 yards, and 6 1/2 yards. What is the perimeter of the flower bed?

_____ feet.

3. The wheel of a hay rake has a nine inch radius. What is the diameter of the wheel? What is the circumference of the wheel?

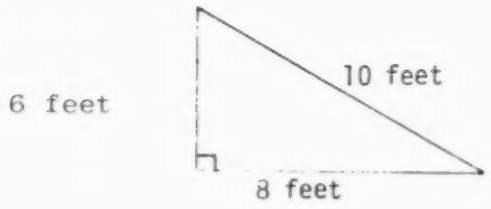
The diameter is _____ inches.
The circumference is _____ inches.

4. Each student in the Horticulture class is in charge of an area of growing bench space which is 54 inches wide and 90 inches long. What is the area of bench assigned to each student?

_____ sq. feet.

5. If each plant requires 8 square inches of space, how many plants could be planted in an area shaped like the triangle below?

_____ plants.



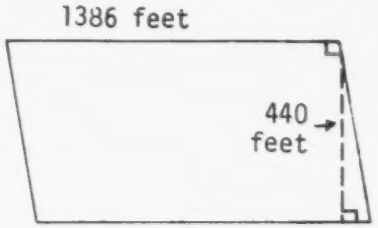
6. A water sprinkler is capable of watering a circular area with a diameter of 28 feet. What is the area that can be watered with the sprinkler?

_____ sq. feet.

7. Mr. Jone's corn field is shaped like the parallelogram shown below. What is the area of his field? (NOTE: 43,560 square feet equals one acre.)

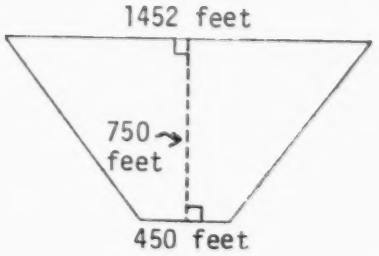
_____ sq. feet.

_____ acres.



8. A soil analysis calls for three tons of lime per acre. How much lime will it take to cover a field shaped like a trapezoid with the measurements indicated in the diagram below?

_____ tons.



9. Inside measurements of a feed box are 26 inches long, 14 inches wide, and 6 inches high. What is the volume of the feedbox?

_____ cu. inches.

10. A farmer is pouring a concrete floor for a circular storage bin. If the floor is to be six inches deep and have a diameter of 24 feet, how many cubic yards of concrete will it take to pour the floor? (NOTE: Round off to nearest 1/2 cubic yard.)

_____ cu. yards.

NAME _____

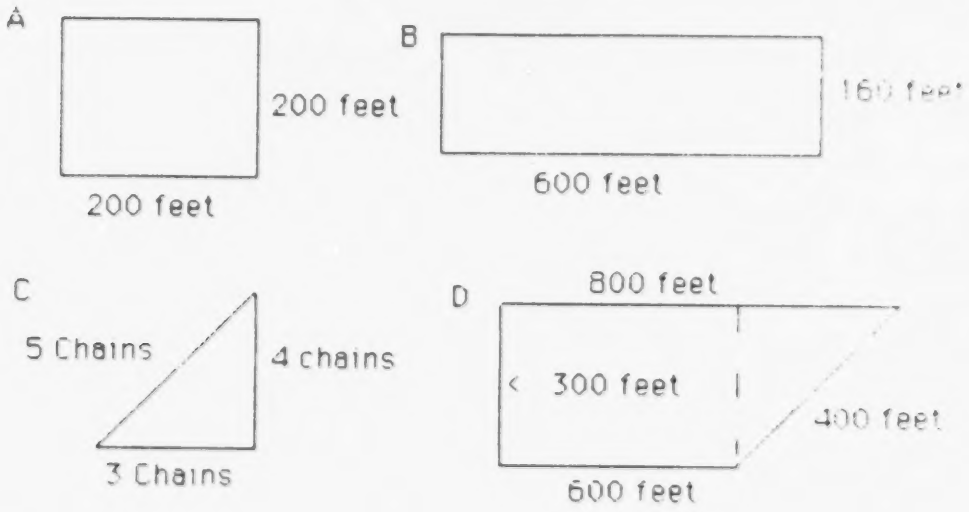
WORKSHEET

COURSE: Agricultural Production I

COMPETENCY: #014 - "Demonstrate the ability to measure cropland"

INSTRUCTIONS: Complete the following problems.

1. Determine the acreage of the fields pictured below to the nearest hundredth of an acre.
   NOTE: (a) 43,560 square feet equals one acre.
   (b) 1 chain equals 66 feet.



A. _____ Acres.

B. _____ Acres.

C. _____ Acres.

D. _____ Acres.

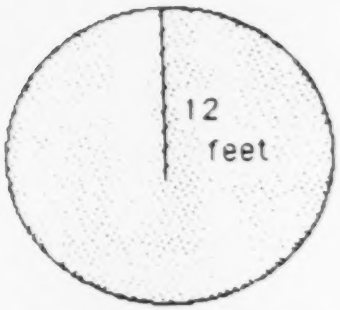
NAME _____

WORKSHEET

COURSE: **Agricultural Production II**

COMPETENCY: **#018 - "Calculate quantities of concrete materials for a given job"**

INSTRUCTIONS: Complete the following problems rounding answers to the nearest hundredth.



Top view of grain drying bin

1. David is constructing a grain drying bin for his farm. The floor will have a radius of 12 feet. He is considering pouring the floor 8 inches deep. If so, how many cubic yards of concrete will it take for the project? _____ cu. yds.

2. If David decides to pour his floor 6 inches deep, how much concrete will he need for the project? _____ cu. yds.

3. If concrete costs 58 dollars per cu. yard, how much more will it cost to pour the floor 8 inches deep instead of 6 inches?

   $ _____ .

ANSWER KEY FOR MODULE TITLED "PERIMETER, AREA, AND VOLUME"

Module Training Unit:

(1.) 446 (2.) 35 1/4 (3.) Diameter = 18" Circumference = 56.52"
(4.) 33.75 (5.) 432 (6.) 615.44
(7.) 609,840 Sq. Ft. 14 Acres
(8.) 49.12 (9.) 2184 (10.) 8 1/2

Competency #14 Worksheet:

(A.) .92 (B.) 2.20 (C.) .6 (D.) 4.82

Competency #018 Worksheet:

(1.) 11.16 (2.) 8.37 (3.) $161.82